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TSODILO LOAPI IRON TECHNO-ECONOMIC EVALUATION

Techno-Economic Evaluation

Tsodilo Loapi Iron Project

22 April 2020

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Revision Schedule							
Rev	**Description**	**Original**	**Review**	**FM Approval**	**Date**	**MDCB Approval**	**Date**
A	Draft	..... MR	..... CF	..... CF		..... VP	

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1 INTRODUCTION

Fraser McGill, in association with Practara, was appointed by the Minerals Development Company Botswana (Pty) Ltd (MDCB) to develop a techno-economic model for the evaluation of the Tsodilo – Loapi (XAUDUM Iron Formation) Project, hereafter referred to as Loapi. Technical evaluation data and costing information was received from the Project Loapi data room and the S&P Global Database. A narrow relationship was maintained to ensure that the data is reasonable and is interpreted correctly.

The model is aimed at providing sound financial evaluation information of Loapi, considering its level of exploration and evaluation, and the potential future expansion and growth opportunities. Specific attention is given to the identification of opportunities for enhancing the business value and the identification of risks that need to be managed to avoid value destruction.

The financial outcomes of the model will assist the MDCB with their decision-making process regarding the possible acquisition of an equity stake in Loapi.

Loapi is located in the Ngamiland District in the north west corner of Botswana near the town of Shakawe and close to the Mohembo border crossing to Namibia. The Ngamiland District in northwest Botswana is one of the poorest and least developed regions of Botswana. Botswana currently has no other iron resources or reserves outside of this Loapi Project resource despite significant but unsuccessful exploration efforts by other companies such as Rio Tinto and BCL.

The project is ~50km from the town of Divundu in Namibia, through which the Trans Caprivi Railway (TCR) line linking Zambia and Namibia, is planned to pass which will provide access to Walvis Bay etc. It is also located within ~70 km of the proposed Angolan, Mucusso line to the Namibe Port.

Botswana has significant coal reserves which can be a major advantage for the Loapi Project, allowing for coal reserves to be used in the beneficiation processes to generate iron products, such as pig iron and iron pellets, but also to produce steel.

The ore body consists of Magnetite Banded Iron Formation which can be upgraded to premium grade magnetite exceeding 67% Fe.

Information available for and preliminary work undertaken by Tsodilo for Project Loapi is at varying levels of confidence. 7 licences were issued through an initial grant.

This document summarises the business case evaluation and financial analysis assumptions and findings of the Loapi project.

2 METHODOLOGY

The information presented in this section describes the techno-economic evaluation methodology, which was applied in the investment evaluation study.

The results presented are incremental, post-tax, post-royalties, ungeared real cash flows and assessed at project level without considering the shareholding structure.

The primary evaluation valued the project in 100% owner-operated terms and comprised both a deterministic and probabilistic analysis. Scenarios were developed based on identified characteristics that may materially impact the investment outcome and risk profile.

A real (Post-tax) discount rate of 14% (Based on a risk profile of a Botswana based target, at an advanced exploration stage and for Iron Ore) was used to provide an NPV outcome for the various business case options. The valuation is based on discounted cash flows utilising full-year discounting, over the Life of Mine “LOM”.

Key evaluation metrics used for the evaluation are NPV (Net Present Value), IRR (Internal Rate of Return), Value-at-Risk (or probabilistic assessment to indicate the uncertainty ranges), CE (Capital Efficiency, or NPV/investment capital), Payback Period (from first expenditure date), and Operating Margin, with the impact of debt not applicable.

From this and the potential solutions, detailed long-term mining plans and production profiles, operating costs, capital schedules (investment, development and stay-in-business) and reports and documents in the Loapi data room from the Target, supplemented with review assumptions prepared based on expert knowledge of the technical and commercial review team, or from sourced first principle inputs to assist with the augmentation of additional alternative options and views as received and documented form the review team. These inputs were prepared as the basis for the schedules and cash flows post 2050. Cost data were aggregated to the level of fixed and variable costs by main activity within the model, per each option. This data was then transferred into the techno-economic evaluation model, which was used as the basis for all deterministic and probabilistic evaluations. These estimates also include appropriate risk factors and contingencies.

The framework shown in Figure 2-1 was used as guideline during the evaluation process.

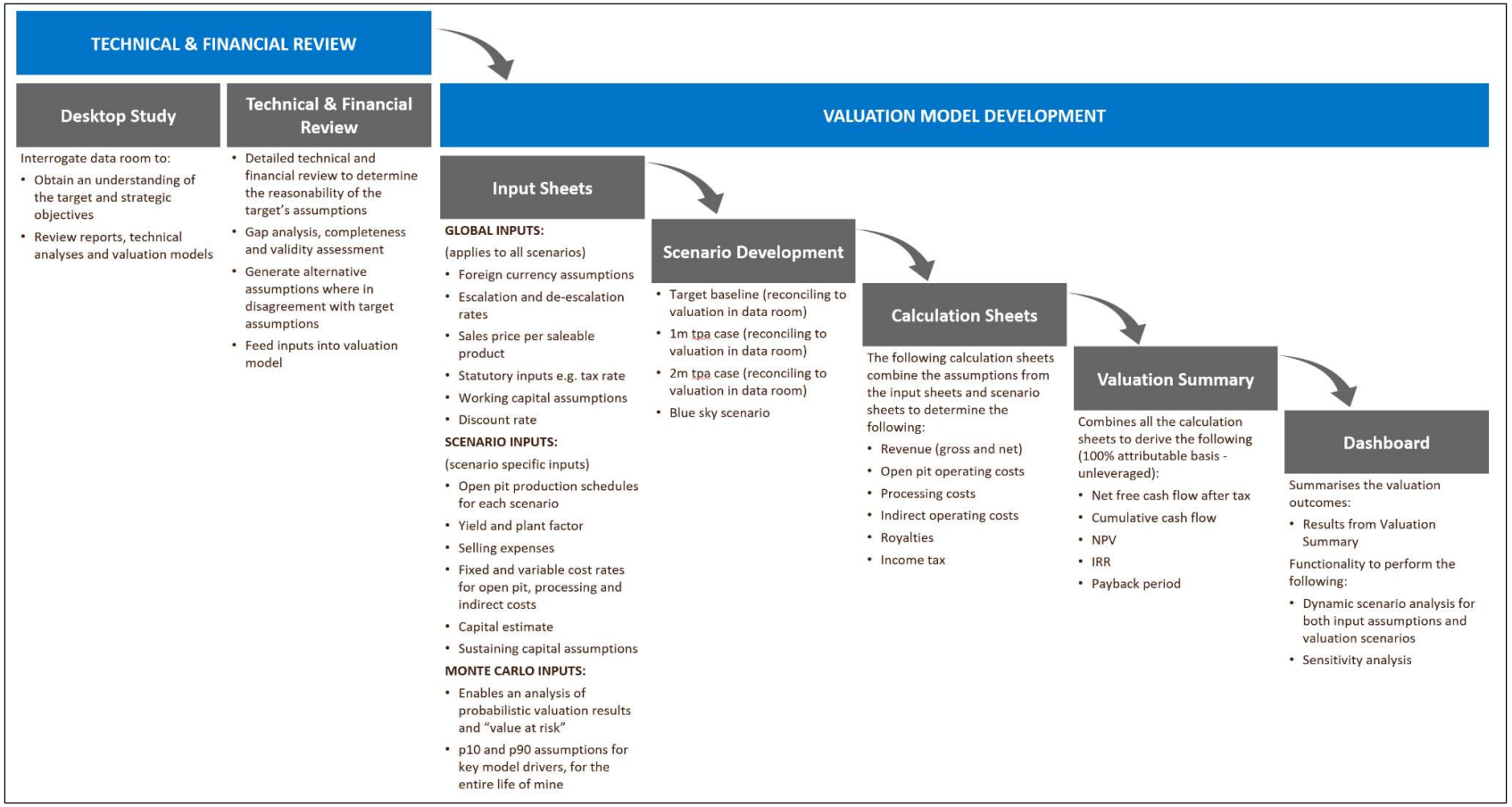

Figure 2-1: Valuation methodology and model development

3 VALUATION MODEL OVERVIEW

3.1 Scenario Layout

The Model contains various scenarios, which can be selected and deselected from the model's dashboard.

Scenarios included in the model are as follows:

1. Base case – Block 1 — 7.2 Mtpa ROM mined (Life of Mine "LOM" 59 Yrs.), which is processed through a concentrator. Concentrated final product will be trucked to Grootfontein and then transported via train to Walvisbay for export.
2. Upsize – Block 1 & 2 — 38 Mtpa ROM mined (LOM 51 Yrs.), which is processed through a concentrator and fed into a pellet plant for further beneficiation. Final product is transported via a railway facility which will be constructed on site.
3. Upsize – Full Target — 63 Mtpa ROM mined (LOM 76 Yrs.), which is processed through a concentrator and fed into a pellet plant for further beneficiation. Final product is transported via a railway facility which will be constructed on site.
4. Blue Sky Scenario 1 — 1.8 Mtpa ROM mined (LOM 59 Yrs.), which is processed through an alternative concentrator. Concentrated final product will be trucked to Grootfontein and then transported via train to Walvisbay for export.
5. Blue Sky Scenario 2 — 1.8 Mtpa ROM mined (LOM 59 Yrs.), which is processed through an alternative concentrator, and fed into a pellet plant and then a FeSi plant for further beneficiation. Final product will be trucked to Grootfontein and then transported via train to Walvisbay for export.

3.2 Monte Carlo Analysis

The Valuation Model was developed to enable Monte Carlo Simulation via @Risk Software, by Palisade. The NPV, as well as the discounted cumulative cashflow, were used as primary outputs of the Monte Carlo Simulations.

Multiple inputs in each scenario are varied between the P10, Most Likely and P90 values and when the Monte Carlo Simulation runs; the simulation randomly selects multiple possible input parameters to calculate a probability distribution for the chosen output.

The simulation included a basic real-option methodology whereby it is assumed only positive NPV simulation runs at the future project execution gate will continue (otherwise the development would stop without executing the project).

4 BUSINESS CASE AND INPUT ASSUMPTIONS

4.1 Basis of Evaluation

A financial model was developed to analyse the economic viability of the project. The model developed real, post-tax, free cash flow forecasts which were discounted to determine the project returns. A financial model 'dashboard' was developed, which gives the user the optionality to select and view the following:

- Real cash flows
- Discount rate used (14% Real Post-tax)
- Key valuation metrics, such as NPV, IRR, payback, etc. (see Table 4.1)
- Cash flow and production summaries

Table 4-1: Basis of valuation

Factor	Assumption
Method of analysis	Discounted cash flow The primary evaluation valued the project in 100% owner-operated terms
Cash flows	Real only
Discount Rate	14% Real (Post-tax)
Internal Rate of Return (IRR)	Based on undiscounted free cash flow (after-tax)
Net Present Value (NPV)	Based on undiscounted cash flow (after-tax)
Undiscounted Payback period	Based on cumulative undiscounted free cash flow (after-tax)
Peak Funding	Maximum cumulative negative cash flow
Project Capital	Capital including contingency
Life of Mine	Calculation based on the production schedule
Capital Efficiency	NPV (real) ÷ undiscounted real project capital
Income tax	Botswana mining tax equation. No unredeemed capital or tax losses were considered

The due diligence team undertook a review of the Target's techno-economic model. Based on the review of the base assumptions and costs in the Target's valuation, changes were proposed for inclusion in the MDCB financial model.

These proposed changes are briefly discussed in the sections that contain a comparison between the Tsodilo assumptions and the MDCB assumptions. Reasons for the changes and the implications to the project are recorded for completeness, where applicable.

The identified differences resulted in a significant difference between the Target's and MDCB's view of the valuation outcome (see Section 4 – Valuation Reconciliation). Blue Sky scenarios were also created to illustrate alternative options. The results are discussed in Section 5.

4.2 Macro-economic Assumptions

The macro-economic assumptions applied in the valuation model below are indicated in real terms, meaning no escalations in any economic inputs and costs, as can be seen below. Assumptions are shown up and to 2035, however assumptions remains unchanged up and to end of mine (2081)

Table 4-2: Macro-economic Assumption

			2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Iron Ore Price	**UoM**	Fe 67% + Premium																
S&P Global 62%	US$/t	◁▷	81.12	74.14	69.76	67.03	68.92	70.50	73.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00
Fe 67%	US$/t	◁▷	87.92	80.36	75.61	72.65	74.70	76.41	79.12	81.29	81.29	81.29	81.29	81.29	81.29	81.29	81.29	81.29
Fe 67% + Premium	US$/lb	◀▶	92.32	84.38	79.39	76.28	78.44	80.23	83.08	85.35	85.35	85.35	85.35	85.35	85.35	85.35	85.35	85.35
Beneficiation	**UoM**	Pellet (50% premium																
Pellet (50% premium on 62%	US$/t	◀▶	122	111	105	101	103	106	110	113	113	113	113	113	113	113	113	113
Fesi75	US$/t	◁▷	1 100	1 100	1 100	1 100	1 100	1 100	1 100	1 100	1 100	1 100	1 100	1 100	1 100	1 100	1 100	1 100
Other	**UoM**	**Input**																
Marketing Cost	US$/t conc	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Fe Payability	%	100.0%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Royalties	**UoM**	**Input**																
Iron Ore	%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%

4.3 Production Inputs

The following production inputs were applied in the valuation model (see Figure 4-1). The MDCB and Tsodilo applied the same production profiles (excluding the Blue-Sky profile, which was provided by an external specialist).

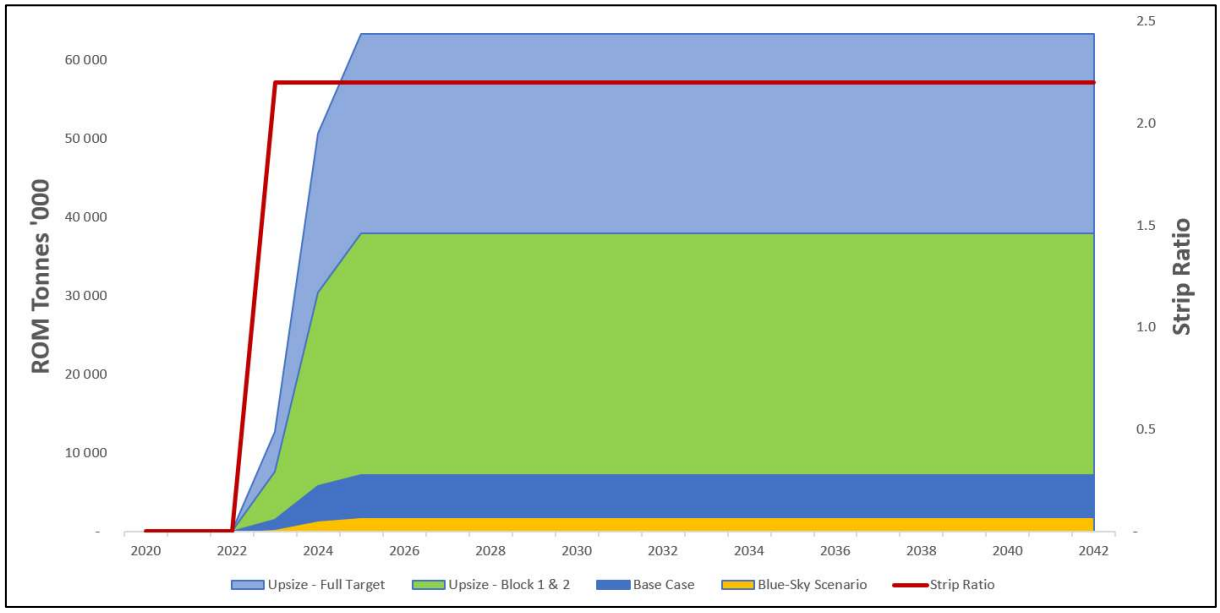

Figure 4-1: Production Tonne Profile

The MDCB's strip ratio of 2.2 is the same as that of Tsodilo's assumption.

The LOM of each scenario differs as described under section 3.1 "Scenario Layout", however for comparative purposes the outputs of the valuation model is based on the base case LOM of 59 years.

An Iron "Fe" grade of 67.2% and recovery of 33.2% was used in the valuation, which was directly obtained from Tsodilo. Beneficiation yield assumptions on the Pellet plant and FeSi plant used were 97% and 94% respectively (these beneficiation assumptions where sourced by the review team). A mining loss of 5% is used across the board, which have been included in the ROM tonnes indicated above.

4.4 Operating Cost Inputs

Table 4-4 shows the operating cost assumptions which were applied in the valuation model. The MDCB's calculations and inputs were based on the Mineral Resource Estimate "MRE" report obtained from SRK Consulting. SRK Consulting is the preferred service provider of Tsodilo.

The costs are in line with those expected in a typical Iron ore open-pit mining operation and the proposed equipment is considered a good match with the production requirements.

The MRE report was prepared in 2014 by SRK, as such actual USA and Botswana CPI rates from 2014 to 2020 have been used to escalate the inputs and assumptions in order to arrive at values believed to be in line with todays' value.

The Historical CPI rates used to escalate the SRK inputs and assumptions are indicated below in table 4-3. These rates were obtained from the S&P Global database.

Table 4-3: Historical CPI Rates

Inputs	2014	2015	2016	2017	2018	2019	2020
Botswana CPI	4.42	3.07	2.82	3.27	3.24	2.79	3.60
USA CPI	1.62	0.12	1.27	2.14	2.44	1.81	1.80

Table 4-4: Operating Cost Assumptions

Input	UoM	Tsodilo Assumption	MDCB Assumption	Reason for Difference
Selling Expenses (the Target only provided a single cost rate; "N/A" added where the detail was not available)				
Marketing & Logistics	% of Revenue	N/A	3%	Tsodilo Marketing & Logistics included in other cost, therefore uncertainty on what their selling expense estimates are. The review team based the 3% on current and historical data.
Total Open Pit Mining Costs				
Base Case	USD/t conc	2.85	2.65	The Tsodilo Opencast mining costs were obtained from the SRK MRE report and escalated to arrive at a the indicated values in todays' terms. The MDCB Opencast mining costs applied by the MDCB review team were obtained from a market benchmark database to arrive at a value believed to be in line with values in todays' terms for this type of mining operation.
Block 1 & 2	USD/t conc	2.83	2.50	
Full Target	USD/t conc	2,83	2.46	
Blue-Sky Option	USD/t conc	N/A	2.77	
Processing Costs (the Target only provided a single cost rate; "N/A" added where the detail was not available)				

Total Processing Cost	USD/t conc	4,74	6.02	The processing costs applied by the MDCB review team were obtained from the SRK MRE report and escalated to arrive at a value believed to be in line with values in todays' terms. Blue Sky option processing cost was obtained directly from Blu Sky.
Blue Sky Scenario	USD/t conc	N/A	4.29	
Pellet Plant	USD/t conc	N/A	14.44	Processing cost was obtained from the S&P Global database, based on similar size plants currently operating.
FeSi Plant ASIC	USD/t Feed	N/A	102.22	AISC based on actual historical costs for a similar size plant. (See section 4.6 below for more information)
FeSi Plant reagent cost	USD/t conc	N/A	94.60	Reagent cost based on actual historical data for similar size plant. (See section 4.6 below for more information)
Indirect Costs				
General & Admin	USD/t conc	4.74	6.02	The general & admin cost applied by the MDCB review team were obtained from the SRK MRE report and escalated to arrive at a value believed to be in line with values in todays' terms. Transport cost applied by the MDCB review team is based benchmark data from an operating coal mine in Botswana supplying coal into Namibia
Transport cost	USD/t transported	10	5.69	

A mining factor based on the size of production was applied by the MDCB review team to adjust the USD/t 2.65 mining cost in order to arrive at an appropriate cost for the upsize scenarios.

Economics of scale method was used based on the available information regarding other similar types of mines.

Benchmark calculations have been performed on the open pit mining cost as well as sustain in business capital "SIB". The SIB capital benchmark indicated a good match, but the mining cost benchmark was higher (this was kept without adjustment, as the cost derived from the SRK report are reasonable)

Table 4-5: Cost benchmarks

Category	UoM	Base Case	Benchmark 1	Benchmark 2	Benchmark 3	Benchmark 4
Mining Cost	USD/t	2.65	4.99	10.04	3.07	4.73
SIB Capital	USD/t	0.33	2.04	3.01	0.97	0.08

Tsodilo used a railway facility as the transport option in the base case as well as both upsize scenarios. MDCB review team only used the rail way facility in the upsize options, while using truck and rail in the base case, as the review team believe that it will be possible to truck and rail the total tonnes produced per annum in the base case.

4.5 Pellet Plant Costs

Operating Cost and Capital cost have bene obtained from Blu Sky Mining Solutions.

Capital estimate for a 1,500 kt pa production plant is USD 120m based on historical actual data. This cost was to calculate a linear increase in order to match the estimated production at Loapi of 2,300 kt pa.

Operating cost has been obtained from the S&P Global database based on historical data of similar size plant of USD/t 14,44 concentrate feed.

4.6 FeSi Plant Costs

The FeSi plant cost have been calculated to produce 427 kt pa from an input feed of 454 kt pa with a yield of 94%.

Two 64 MWh Furnaces will be installed with an utilisation of 85%. Historical actual data of a 6 MWh furnace was used to calculate the necessary All-In Sustaining Cost "ASIC" (excluding reagents) for the two 64 MWh Furnaces based on the rule of Six-tenths approximation costing.

Reagent cost and ratios was obtained from historical data to produce a FeSi20 final product.

Capital cost was based on historical actual data relating to a 12 MW greenfields Furnace, using the rule of Six-tenths approximation costing to obtain the required capital cost for a 427 kt pa production plant.

Table 4-6: ASIC Cost Estimate

ASIC Cost estimate	Value	UoM
Effective cost per tonne	**102.22**	USD/t
Exchange Rate	15	USD: ZAR
Operational cost For Furnace Operations	508 879 879	ZAR
Refractory Cost For Furnace Operations	126 969 467	ZAR
Engineering Cost For Furnace Furnaces	7 669 193	ZAR
Engineering Labour Cost For Furnace Furnac	22 309 204	ZAR
Labour Cost For Furnace Furnaces	36 071 694	ZAR
Total Costs	**701 899 437**	ZAR

FeSi Processing Cost	kg/t Fesi20	Var UoM	Variable cost	Adjusted cost
Quartz	370	US$/t	79.15	29.29
Coke	200	US$/t	325.00	65.00
Electrode Paste	10	US$/t	21.50	0.21
Electric Energy (Mwh/t)	2.1	$/kwh	0.05	0.10

Table 4-8: Capital Cost Estimate

Furnace Capital	UoM	Value
Sub Total	ZAR	**290 010 000**
OEM	ZAR	43 501 500
EPCM	ZAR	29 001 000
Contingincy (50%)	ZAR	181 256 250
Owners team cost	ZAR	3 100 000
2013	ZAR	**546 868 750**
cost escalation	%	5%
2020	ZAR	**769 499 249**
Rand per MW	ZAR	**64 124 937**
Capital Cost Estimte	ZAR	**492 479 520**
Exchange Rate	USD: ZAR	15
Capital Cost Estimte	USD	**32 549 869**

4.7 Capital Expenditure

The project capital expenditure will commence in 2022 for the mine and processing plant. Study cost have been included in the model as an incremental cost item and not as sunk cost, due to the cost will be incurred after the valuation date, it is estimated to be spend over 2 years, starting in 2020.

The Tsodilo valuation model for the upsize scenarios only indicated one all in capital cost, as such the base case capital split was used to calculate a linear cost increase for the upsize scenarios, with the remaining cost of Tsodilo indicated as “other capital cost” in the tables below.

The following items were included in the capital estimate.

The capital estimates below are split out below per scenario. Each scenario is shown individually.

Table 4-9: Base Case – 7.2 Mtpa

Input	UoM (real)	Target Assumption	MDCB Assumption	Reason for Difference
Mine Establishment, development and study cost	US$'000	17,800	17,800	The MDCB team used capital as per the Tsodilo Capital cost estimate.
Concentrator	US$'000	130,270	130,270	The MDCB team used capital as per the Tsodilo Capital cost estimate.
Off-site cost	US$'000	12,730	12,730	The MDCB team used capital as per the Tsodilo Capital cost estimate.
EPC cost	US$'000	34,500	34,500	The MDCB team used capital as per the Tsodilo Capital cost estimate.
Mine Closure	US$'000	4,900	4,900	The MDCB team used capital as per the Tsodilo Capital cost estimate.
Railway Facility	US$'000	365,500	N/A	The MDCB team excluded the railway facility from the base case, as final product will be transported via truck and rail
Contingency	US$'000	27,495	60,060	Contingency was calculated at 30% on total capex. Benchmark obtained from the MDCB
Total Capital	**US$'000**	**593,195**	**260,260**	

The MDCB review team used 5% of total capex for SIB Capital calculation, which has been benchmarked (See table 4-5). Tsodilo TEM excluded SIB capital.

Table 4-10: Upsize – Block 1 & 2 – 38 Mtpa

Input	UoM (real)	Target Assumption	MDCB Assumption	Reason for Difference
Mine Establishment, development and study cost	US$'000	82,421	82,421	The MDCB team used capital as per the Tsodilo Capital cost estimate.

Concentrator	US$'000	1,130,237	1,130,237	The MDCB team used capital as per the Tsodilo Capital cost estimate.
Off-site cost	US$'000	110,447	110,447	The MDCB team used capital as per the Tsodilo Capital cost estimate.
EPC cost	US$'000	299,326	299,326	The MDCB team used capital as per the Tsodilo Capital cost estimate.
Pellet Plant	US$'000	N/A	180,000	The MDCB team used the cost as provided by Blue-Sky. Refer to section 4.5 for more information.
Mine Closure	US$'000	42,513	42,513	The MDCB team used capital as per the Tsodilo Capital cost estimate.
Railway Facility	US$'000	365,500	365,500	The MDCB team excluded the railway facility form the base case, as final product will be transported via truck and rail. Capital for upsize scenarios remained unchanged, due to as per Tsodilo, the base case capex facility will have capacity for increase in production tonnes
Other Fixed Cost	US$'000	2,731,006	N/A	Other Fixed cost relates to cost not allocated to specific driver, as Tsodilo only provided one amount for Capital cost, as such remaining cost was grouped under "other fixed cost"
Contingency	US$'000	238,550	685,416	Contingency was calculated at 30% on total capex. Benchmark obtained from the MDCB
Total Capital	**US$'000**	**5,000,000**	**2,895,860**	

The MDCB review team used 5% of total capex for SIB Capital calculation, which has been benchmarked (See table 4-5). Tsodilo TEM excluded SIB capital.

Table 4-11: Upsize – Full Target – 63 Mtpa

Input	UoM (real)	Target Assumption	MDCB Assumption	Reason for Difference
Mine Establishment, development and study cost	US$'000	102,550	102,550	The MDCB team used capital as per the Tsodilo Capital cost estimate.
Concentrator	US$'000	1,582,332	1,582,332	The MDCB team used capital as per the Tsodilo Capital cost estimate.
Off-site cost	US$'000	154,628	154,626	The MDCB team used capital as per the Tsodilo Capital cost estimate.
EPC cost	US$'000	419,056	419,056	The MDCB team used capital as per the Tsodilo Capital cost estimate.
Pellet Plant	US$'000	N/A	180,000	The MDCB team used the cost as provided by Blue-Sky. Refer to section 4.5 for more information. Capex amount for upscale mine remained the same, as production of Pellet tonnes remained unchanged. Remaining tonnes are sold as concentrate. Further studies in PEA phase need as there is room for possible increase in pellet tonne production
Mine Closure	US$'000	59,518	59,518	The MDCB team used capital as per the Tsodilo Capital cost estimate.
Railway Facility	US$'000	365,500	365,500	The MDCB team excluded the railway facility form the base case, as final product will be transported via truck and rail. Capital for upsize scenarios remained unchanged, due to as per Tsodilo, the base case capex facility will have capacity for increase in production tonnes

Other Fixed Cost	US$'000	3,982,446	N/A	Other Fixed cost relates to cost not allocated to specific driver, as Tsodilo only provided one amount for Capital cost, as such remaining cost was grouped under "other fixed cost"
Contingency	US$'000	333,970	881,357	Contingency was calculated at 30% on total capex. Benchmark obtained from the MDCB
Total Capital	**US$'000**	**7,000,000**	**3,744,939**	

The MDCB review team used 5% of total capex for SIB Capital calculation, which has been benchmarked (See table 4-5). Tsodilo TEM excluded SIB capital.

4.8 Cash Flows Not Considered

The following cash flows were not considered in the valuation:

- Residual values for fleet, infrastructure and equipment as the fleet is contracted and assumed life of the process plant is designed for Life of mine.
- Sunk costs
- Finance charges or cash flows relating to debt

4.9 Discounting

The discount rates, used to calculate the present value of future cash flows, was based on an internal weighted average cost of capital calculation. The discount rate was applied to the Base Case and all scenarios at 14% in real terms

5 DETERMINISTIC VALUATION RESULTS

5.1 Combined Results

The real MDCB valuation results are listed in Table 5-1 below

Table 5-1: Deterministic Valuation Results

	UoM*	Base Case	Upsize – Block 1 & 2	Upsize – Full Target	Blue – Sky Scenario 1	Blue – Sky Scenario 2
NPV (Post-tax)	US$ mil	82	(350)	287	(8)	854
IRR	%	19%	N/A	15%	N/A	82%
Payback	**Years**	**9**	**12**	**10**	**11**	**5**
Project Capital	US$ mil	260	2,837	3,746	105	~200
Capital Efficiency	ratio	0.31	(0.12)	0.08	(0.07)	~0.7
Operating Margin	%	35%	34%	34%	38%	68%

*UoM – Unit of measure, all in real terms

The table above indicates that the Blue-Sky scenario 2 is the best case. While the Base Case will be the primary Alternative, with the Upsize – Full Target as the secondary, but best alternative option. As such further focus will only be placed on these 3 scenarios.

5.2 Base case – Block 1

This scenario assumes ROM of 7.2 Mtpa over a LOM of 59 years.

Base Case generates positive cashflow and the operating margin is similar to that of the Upside Full Target scenario, however the LOM is 14 years shorter, as such less time to repay the initial project capital, resulting in a lower NPV

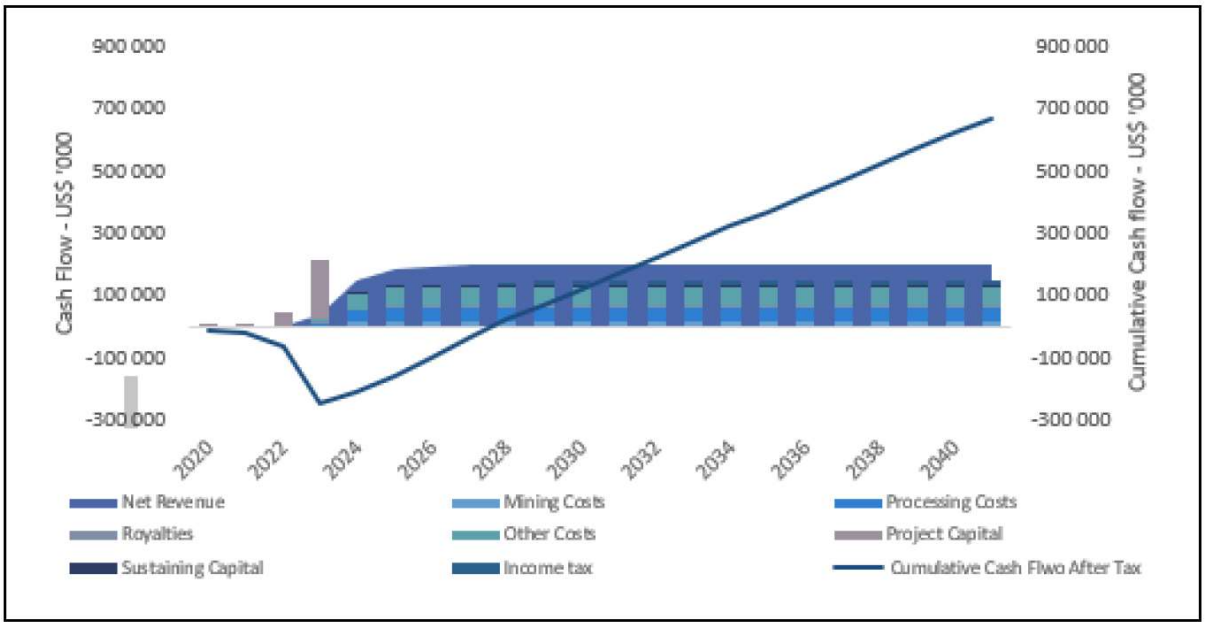

Figure 5-1: Valuation Results – Base Case – Block 1

5.3 Upsize – Full Target option

This scenario assumes ROM of 63 Mtpa over a LOM of 76 years.

Both the Upsize – Full Target and Upsize – Block 1 & 2 generates positive cashflow, however the Upsize – Full Target has a longer period to repay the initial capital, due to the LOM being longer (76 years compared to 51 years), which results in a positive NPV.

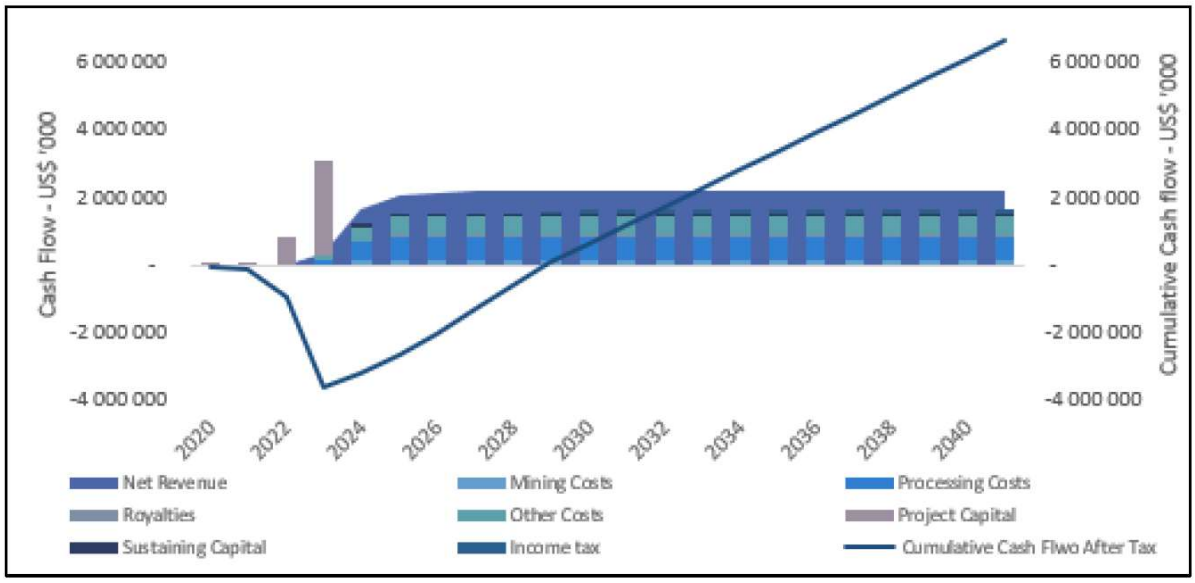

Figure 5-1b: Valuation Results – Upsize – Full Target

5.4 Blue Sky Option

Two blue-sky scenarios were included in the model to determine the upside potential of further beneficiation through a pellet and FeSi plant.

Initial work was performed by Blu Sky Innovative mining solutions. All cost, yields and rates used were directly obtained from the Blu Sky project report.

Blu Sky modelled a 600 kt pa production concentrator plant. Exploration and preliminary laboratory work indicated that a 67.2 Fe concentrate grade can be produced using Magnetic separation at a grind rate of P80 at 80 µm.

A pellet plant and FeSi plant was scaled in order to feed the concentrate produced from the Blu Sky concentrator plant.

In summary, the scenarios assume the following

- Total ROM tonnes feed of 1.8 Mtpa
- Concentrate mass yield of 33%
- Strip ratio was kept unchanged at 2.2:1
- Concentrate grade of 67.2%
- Pellet plant yield of 97%
- FeSi plant yield of 94%

All other economic parameters were kept the same as in the base case.

The Blue-Sky scenarios produced higher operation margins that the base case and upsize scenarios, with less initial capital due to less ROM mined and the smaller plants. The Blue-Sky

scenario 2 NPV is significantly bigger than the other options, this is mainly due to the selling of a FeSi product which currently sells for USD/t 1,100 compared to concentrate selling for USD/t 92.32 and pellets for USD/t 122.

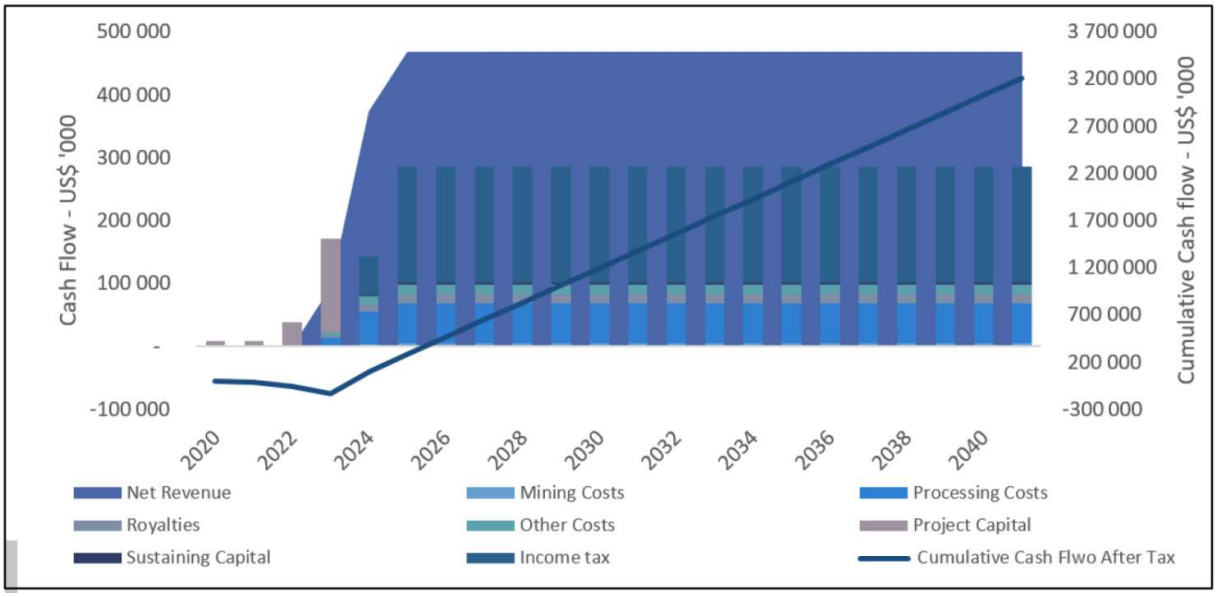

Figure 5-2: Valuation Results – Blue Sky Scenario 2

6 SENSITIVITY AND MONTE CARLO ANALYSIS

6.1 Inputs

The p10, "most likely" and p90 ranges were applied in the sensitivity and probabilistic analyses.

Table 6-1: P10 and P90 Ranges

	p10 (10th Percentile)	Most Likely	P90 (90th Percentile)
Fe Concentrate Price	The p10 range modelled with a -30% downside based on current and historical data USD/t 65	USD/t 85 LT	The p90 range modelled with a +20% upside based on current and historical actual data USD/t 111
Pellet Price	The p10 range modelled with a -30% downside based on current and historical actual data USD/t 86	USD/t 122	The p90 range modelled with a +20% upside based on current and historical actual data USD/t 147
FeSi Price	The p10 range modelled with a -30% downside based on current and historical actual data USD/t 770	USD/t 1,100	The p90 range modelled with a +10% upside based on current and historical actual data USD/t 1,210
Fe Mine Grade	The p10 range assumed the same downside as upside potential. 62%	67.2%	+8% upside potential based on current stage of project obtained from Tsodilo 73%
Fe Recovery	-10% downside potential based current stage of project. 30%	33%	+5% upside potential based current stage of project. 35%
Pellet Plant Yield	The p10 range assumed the same downside as upside potential. 92%	97%	+5% upside potential based current stage of project. Capped at 99% 99%
FeSi Plant Yield	The p10 range based on research and actual historical information 90%	93%	The p90 range based on research and actual historical information 95%
Marketing & Logistics	The p10 range assumed the same downside as upside potential.	3%	+30% upside potential provided by MDCB.

	2.10%		3.90%
Contingency Fee – mining, concentrator, logistics, pellet plant and support costs	The p10 range assumed the same downside as upside potential. 0%	10%	+10% upside potential based on the current stage of the project. 20%
Contingency Fee – Fesi Plant Opex	The p10 range assumed the same downside as upside potential. 0%	20%	+20% upside potential based on the current stage of the project. 40%
Development Capital **Contingency – Mine and Pellet Plant**	-30% downside provided by MDCB. 0%	30%	+20% upside potential provided by MDCB. 50%
Development Capital **Contingency – Blue-Sky scenarios and Fesi Plant**	-50% downside potential based on the current stage of the project. 0%	50%	+25% upside potential based on the current stage of the project. 75%
SIB Capital	Assumed a 3% cost decrease. 2%	5%	Assumed a 2% cost increase. 7%

6.2 Sensitivity Analysis

A tornado diagram has been used for sensitivity analysis as it indicates the sensitivity of the NPV to selected model inputs. Each input was flexed to its p10 and p90 level whilst keeping the other inputs constant. The bars in the graph represent the NPV after the input is changed.

The tornado diagram below indicates the impact of the ranges on the NPV mentioned in Table 6-1

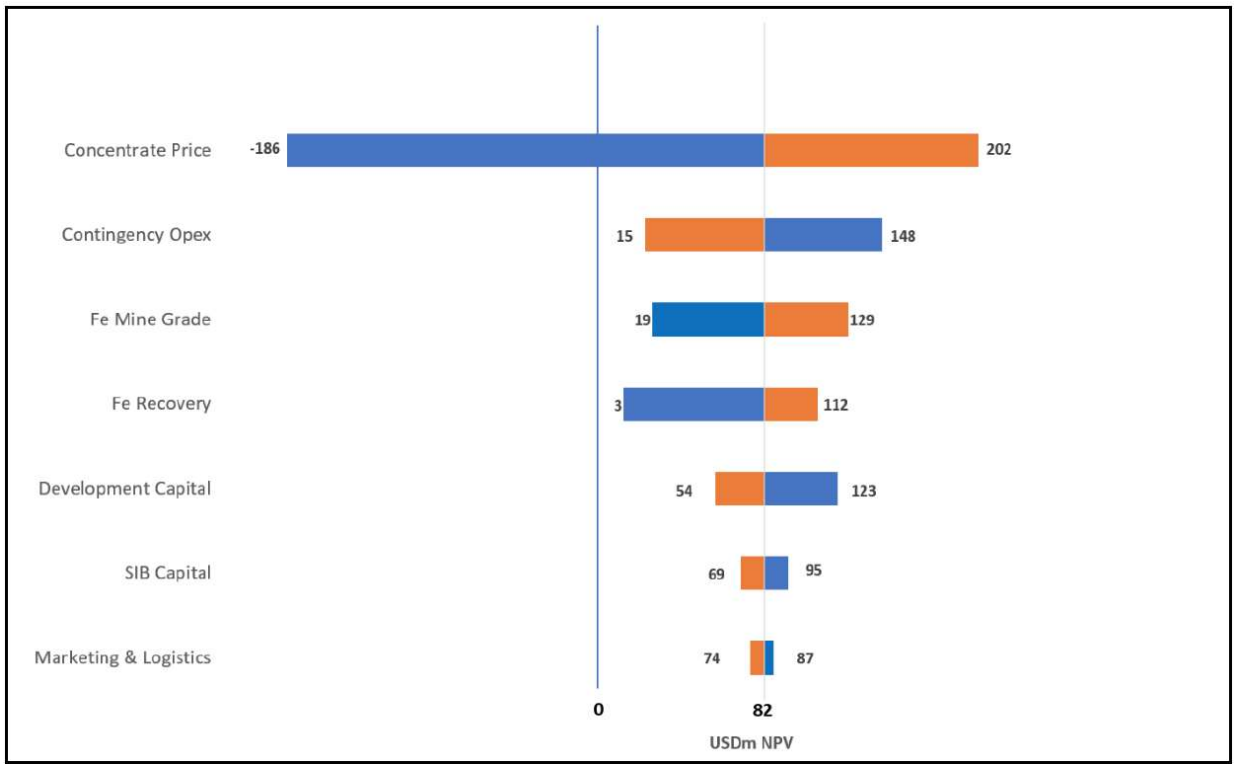

Figure 6-1a: Tornado (Sensitivity) Diagram: Base Case – Block 1

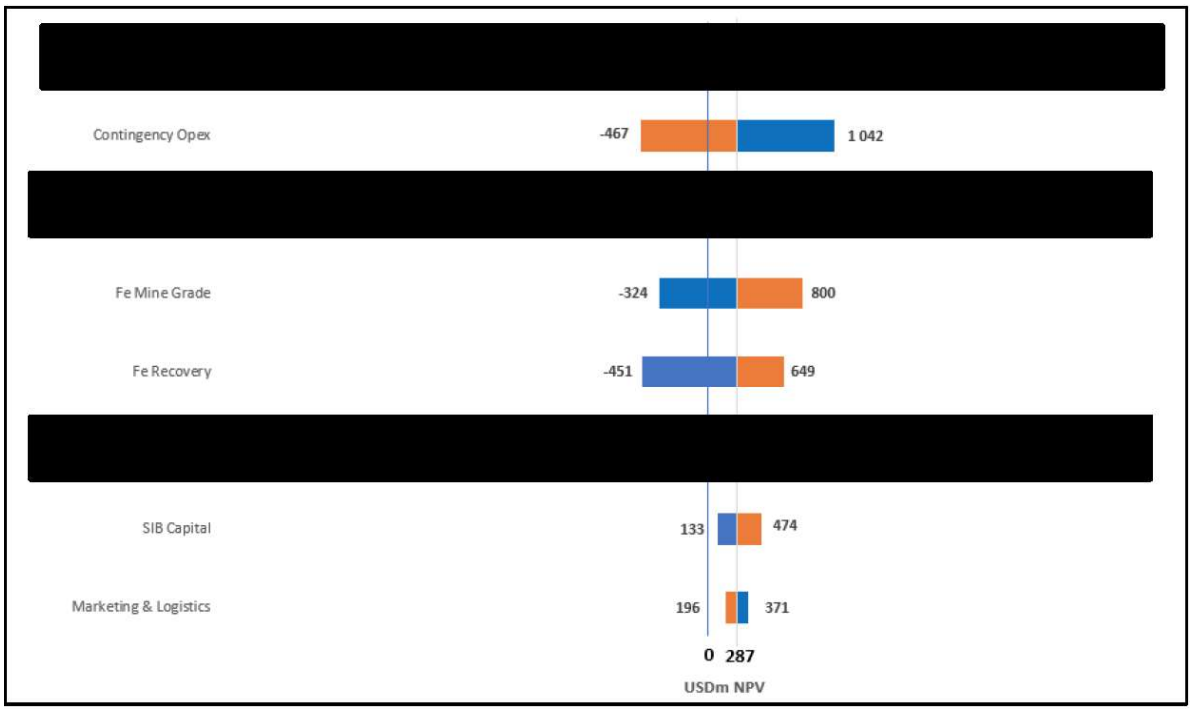

Figure 6-1b: Tornado (Sensitivity) Diagram: Upsize – Full Target

Figure 6-1c: Tornado (Sensitivity) Diagram: Blue Sky Scenario 2

Figure 6-1a indicates that the NPV is generally the most sensitive to changes in sales prices and opex contingency. The mine grade of Iron and Fe recovery ranges results in these inputs also being ranked high in the sensitivity analysis.

Figure 6-1b indicates that the NPV is generally the most sensitive to changes in sales prices and opex. The Capex range results in this input being ranked high in the sensitivity analysis.

Figure 6-1c indicates that the NPV is generally the most sensitive to changes in the FeSi sales prices and FeSi plant opex. The change in the FeSi plant yield result in this input also being ranked high in the sensitivity analysis.

The Upsize – Full target indicated in Figure 6-1b above indicates a higher positive NPV than the Blue-Sky scenario 2 option based on the sensitivity on sales prices, however, also indicates the lowest NPV as well (thus riskier).

6.3 Monte Carlo Analysis

The discounted cashflow calculation was adjusted for the Monte Carlo analysis. The advanced exploration discounting of 3% included in the discount rate, has been removed, as this is modelled within the MC p10/p90 range, thus for Monte Carlo analysis purposes the discount rate is 11% real.

The equation was developed in such a way that the discounted cashflow for each year was included in the NPV, should the sum of the future cashflow be greater than the current year's discounted cashflow. If the future cashflow returns a value smaller than the current year, the current year cashflow will return a value of zero. The reason being that the study cost will be incurred after the valuation date, and once the studies have been completed a decision will be taken whether to invest in the project. At that point in time, study cost will be sunk cost, and therefore should the future cashflow be positive or greater than the current cash outflow the project will mostly likely

generate positive returns. Based on this method, the negative NPV is capped at the study cost incurred.

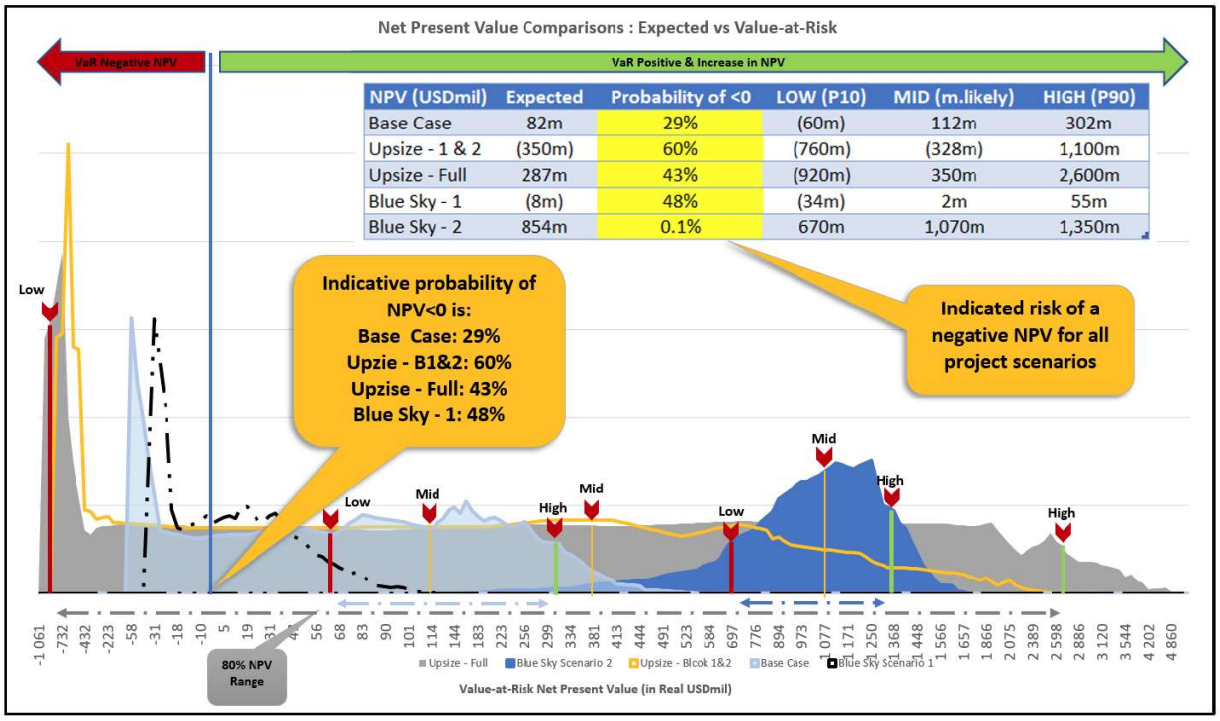

Figure 6-2: Net Present Value Comparison: Expected vs Value –at-Risk

Figure 6-2 above as well as the deterministic valuation results indicates that the Blue-Sky scenario 2 results in the most profitable while the Upside – Full target option resulted in being the best alternative to the Blue-Sky scenario, and the Base Case as the preferred alternative to the Blue-Sky scenario. As such further analysis will only be focused on these 3 scenarios. The Upside – Full and Blue Sky 1 have the highest possible returns with a P0 of 2,600m and $1,350m respectively.

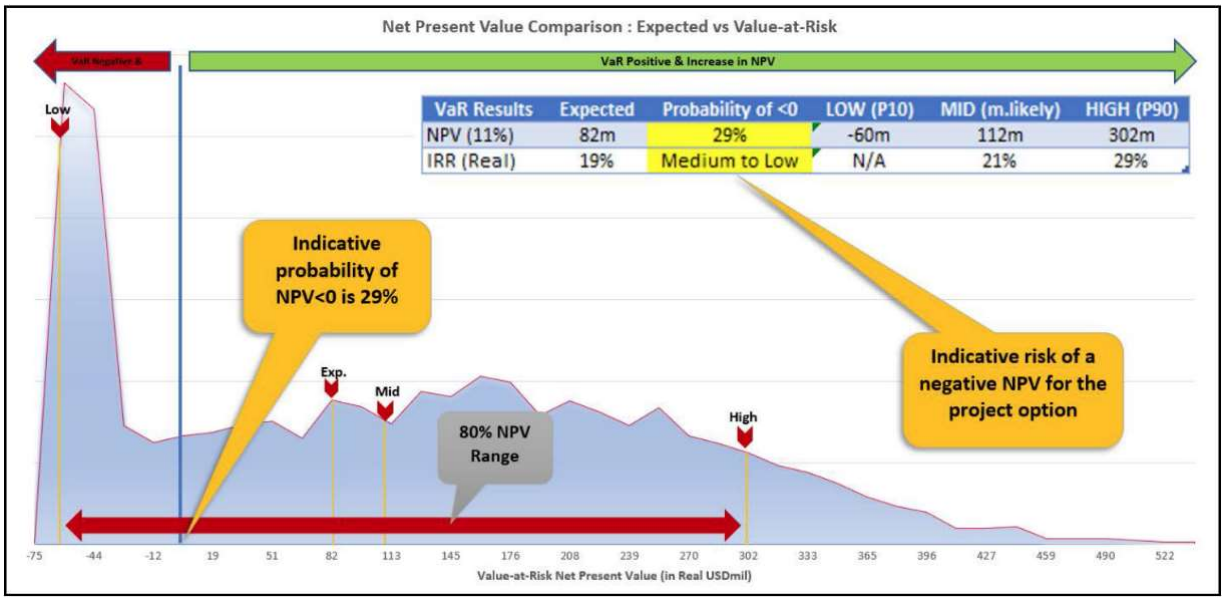

Figure 6-3a: Net Present Value Comparison: Base Case – Block 1

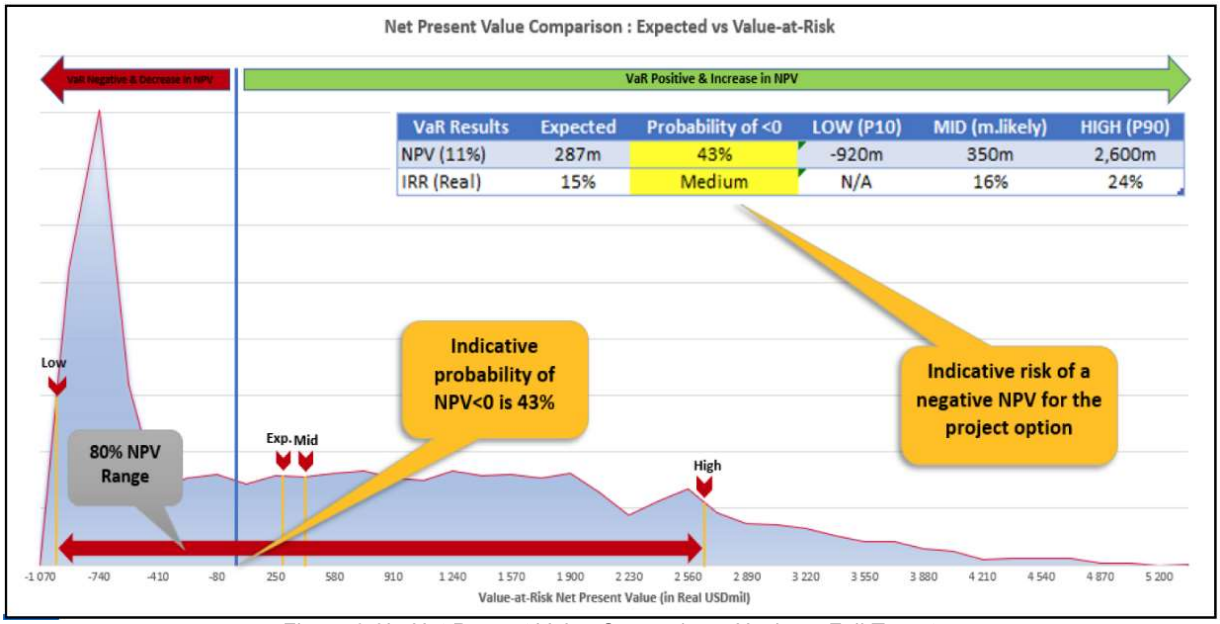

Figure 6-3b: Net Present Value Comparison: Upsize – Full Target

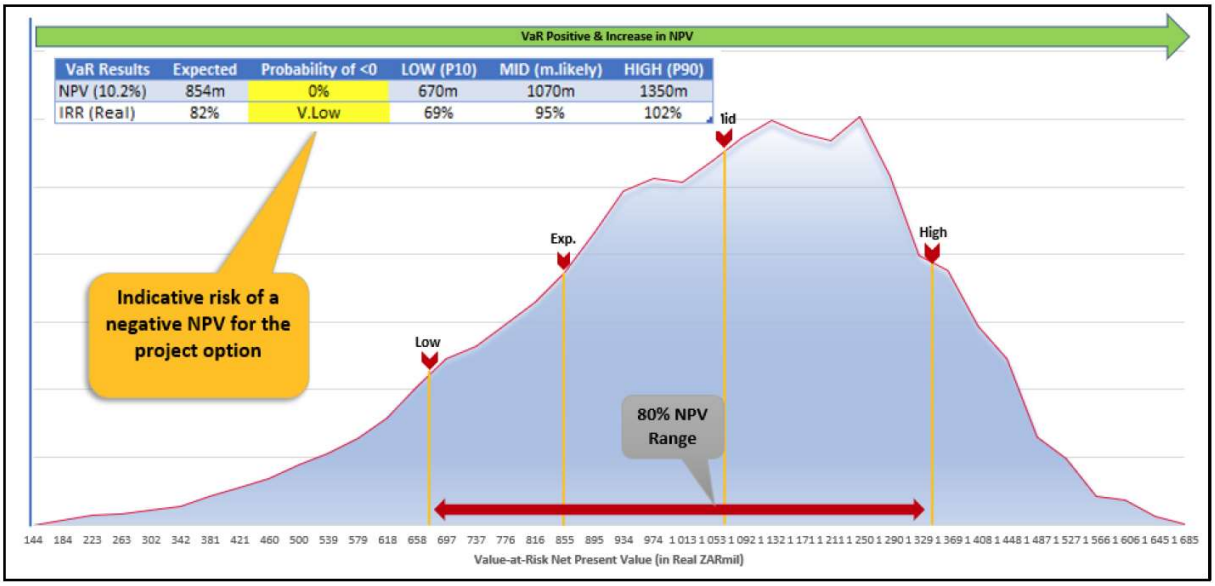

Figure 6-3b: Net Present Value Comparison: Upsize – Blue Sky scenario 2

Figure 6-3a indicates that there is a 29% probability that the Base Case – Block 1 option will have an NPV of lower than zero. Figure 6-3b indicates that there is a 43% probability that the Upsize – Full Target option will have an NPV of lower than zero, whilst Figure 6-3c indicates that the Blue-Sky scenario 2 has a very small chance of generating negative cashflow.

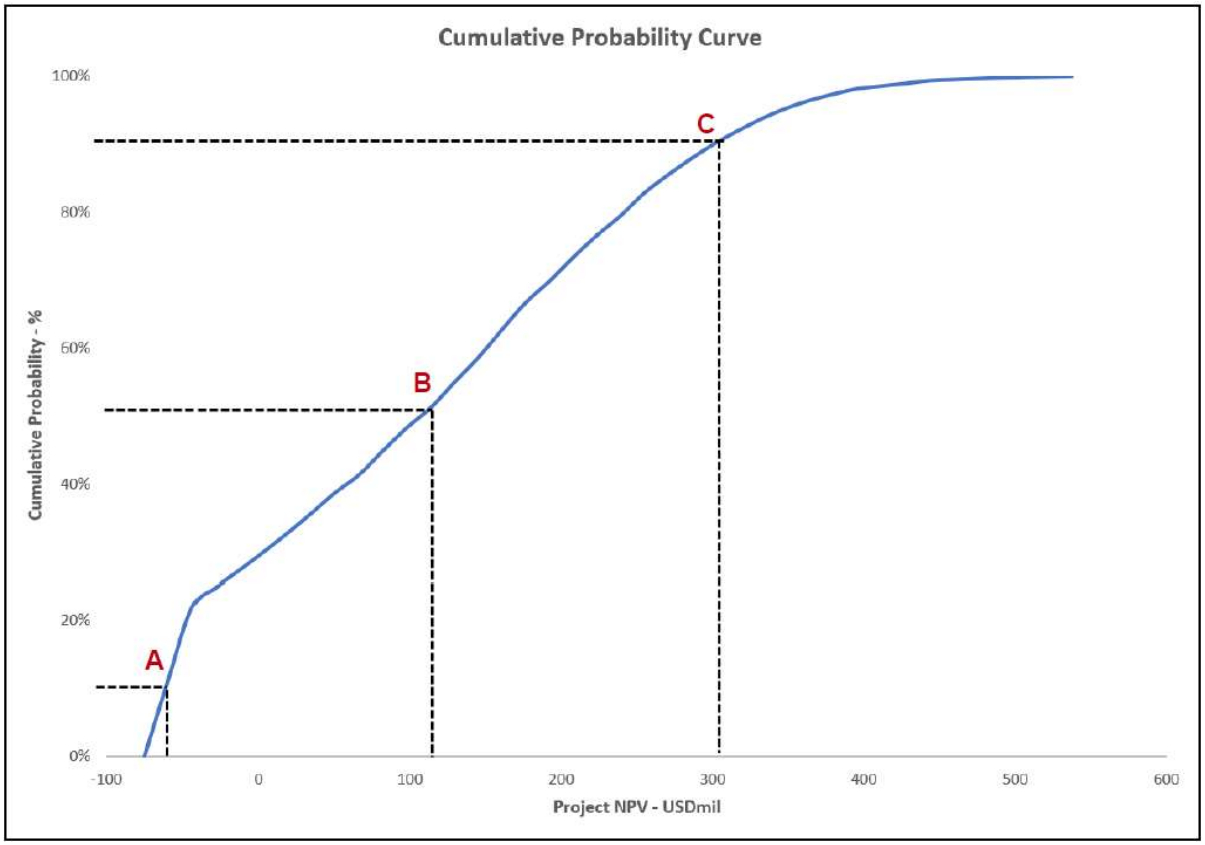

Figure 6-4a: Cumulative Probability Curve: Base Case – Block 1

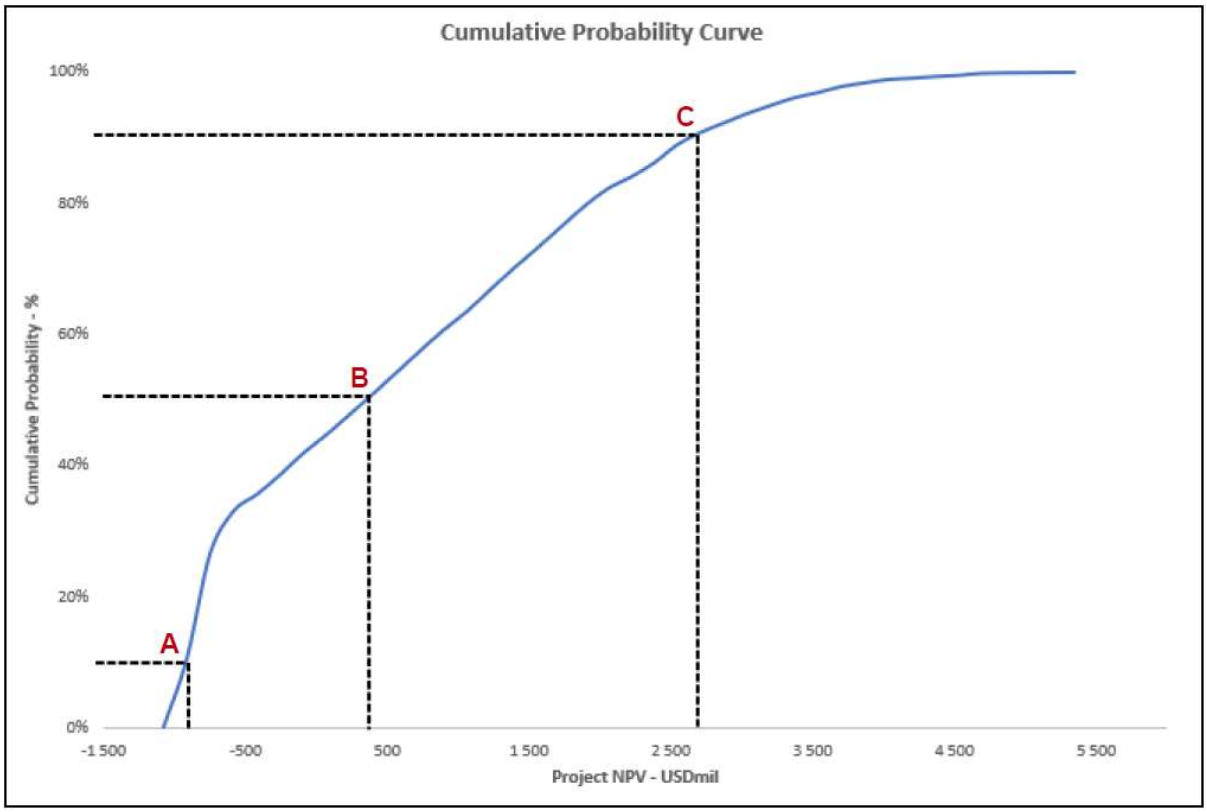

Figure 6-4: Cumulative Probability Curve: Upsize – Full Target

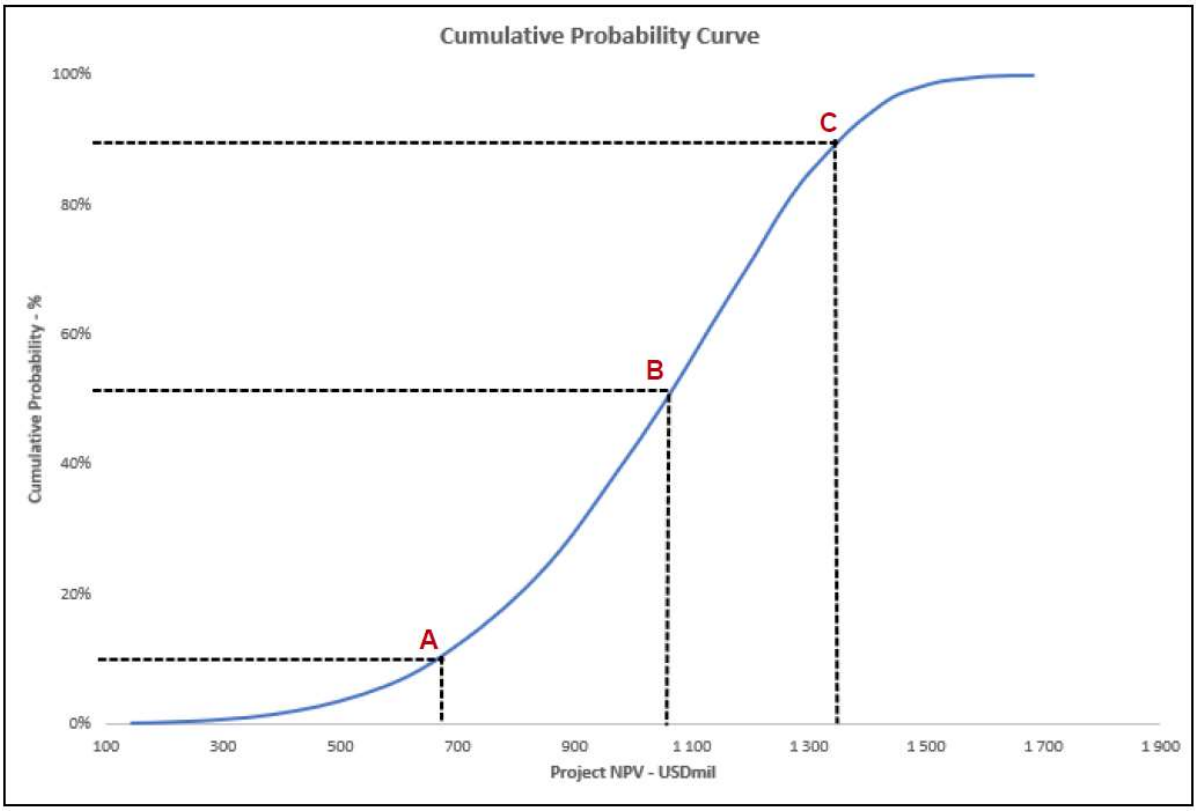

Figure 6-4c: Cumulative Probability Curve: Upsize – Blue Sky Option

The Probabilistic Analysis shown in Figure 6-4a indicates the following:

A) There is a 10% probability that the project will return an NPV less than USD -60m

B) There is a 50% probability that the project will return an NPV of USD 112m

C) There is a 90% probability that the project will return an NPV less than USD 302m

The Probabilistic Analysis shown in Figure 6-4b indicates the following:

A) There is a 10% probability that the project will return an NPV less than USD -920m

B) There is a 50% probability that the project will return an NPV of USD 350m

C) There is a 90% probability that the project will return an NPV less than USD 2,600m

The Probabilistic Analysis shown in Figure 6-4c indicates the following:

A) There is a 10% probability that the project will return an NPV less than USD 670m

B) There is a 50% probability that the project will return an NPV of USD 1,070m

C) There is a 90% probability that the project will return an NPV less than USD 1,350m

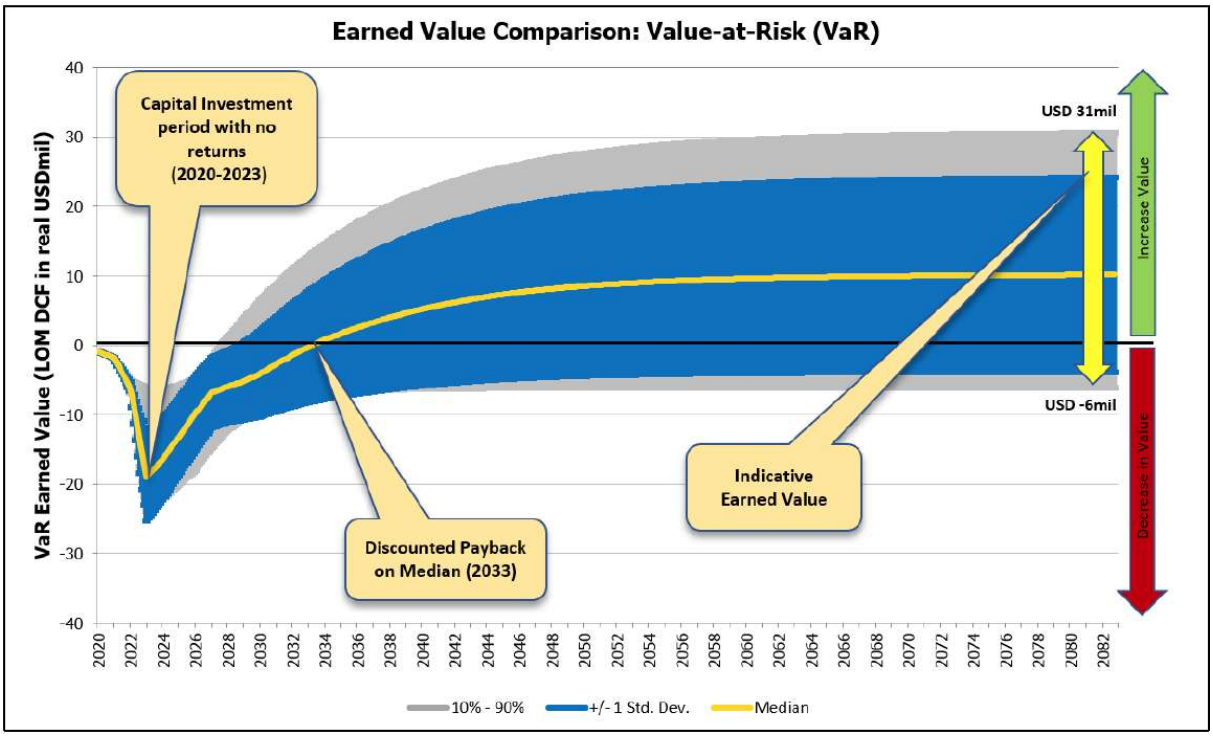

Figure 6-5a: Earned Value Comparison: Upsize – Base Case Block 1

Figure 6-5a illustrates the cumulative probabilistic free cash flow for the project. The curve indicates that the project will have positive cash flows. With an optimistic view on risk.

P90 (best) discounted payback period is 7 years, and a most likely mine life of 59 years

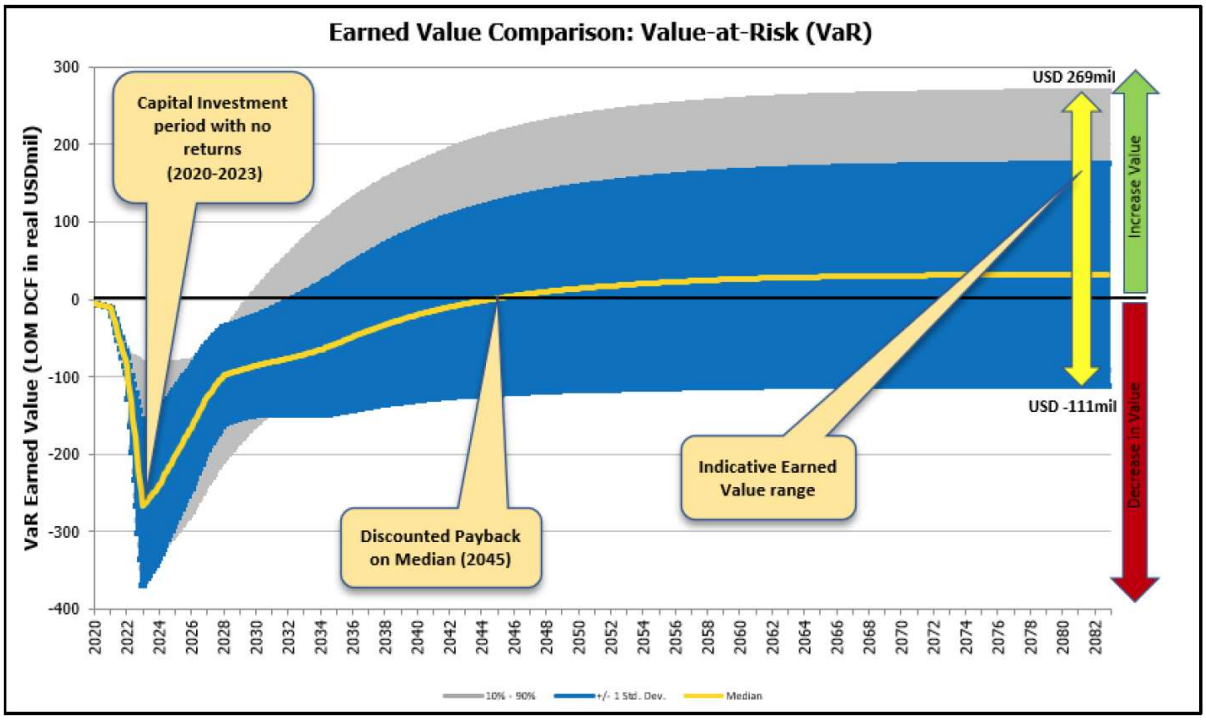

Figure 6-5b: Earned Value Comparison: Upsize – Full Target

Figure 6-5b illustrates the cumulative probabilistic free cash flow for the project. The curve indicates that the project will have positive cash flows. With an optimistic view on risk.

P90 (best) discounted payback period is 9 years, and a most likely mine life of 76 years.

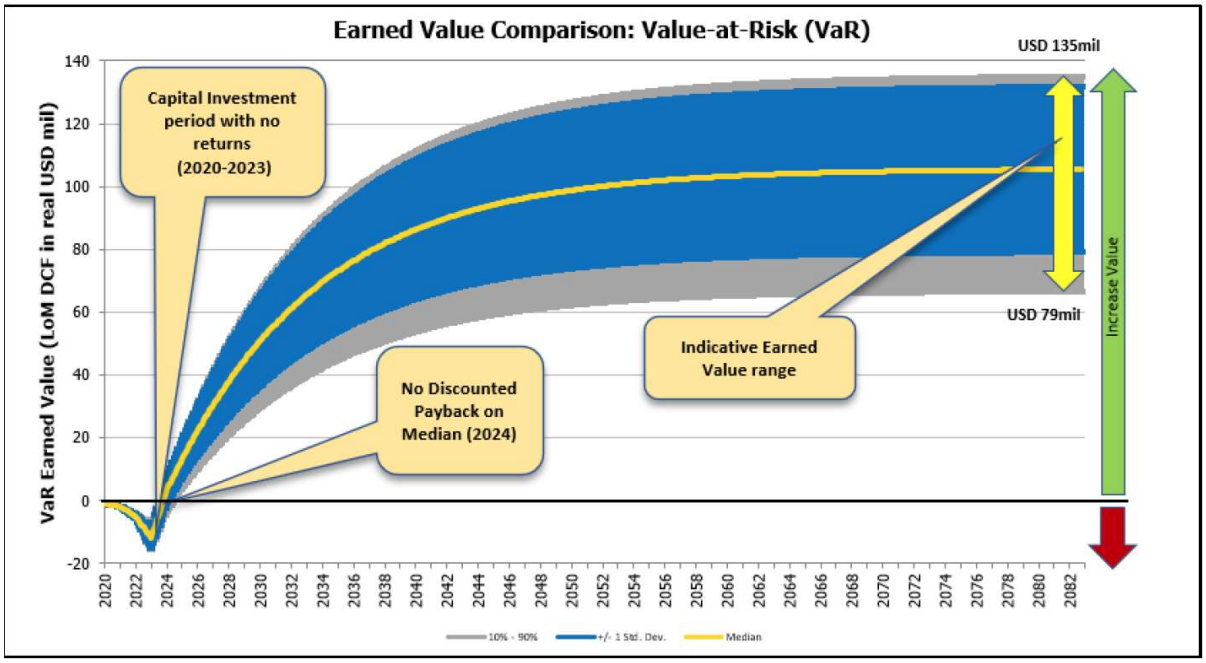

Figure 6-5c: Earned Value Comparison: Blue Sky scenario 2

Figure 6-5c illustrates the cumulative probabilistic free cash flow for the project. The curve indicates that the project will have positive cash flows.

P90 (best) discounted payback period is 3 years, and a most likely mine life of 59 years.

7 RECOMMENDATIONS

There is a large disparity between Tsodilo's service provider and MDCB's input assumptions. The Target's owners believe that the project is highly attractive when looking at the Base case as well as Upsize scenarios. MDCB review team is of the opinion that the project will only generate positive cashflow if:

1) Full Target is mined, and concentrate is further beneficiated through a pellet plant; or
2) A blue-sky option is followed, where less ore is mined, and the product is further beneficiated through a pellet and FeSi plant.